

CLAIMS:

1. A motor, comprising a first body (3), a second body (5) movably mounted with respect to the first body (3), a chamber (4) situated between a surface of the first body (3) and a surface of the second body (5), said chamber (4) being filled with a non-polar and/or non-conductive first fluid (6) and at least one volume of a polar and/or conductive second fluid (7a-d), the fluids (6, 7) being immiscible, wherein one of said surfaces, to be called the first surface, is provided with means for locally varying the wettability of said surface by the second fluid (7) and the other surface, to be called the second surface, is provided with means for coupling the or each volume of second fluid (7a-d) to the second surface.
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2. A motor according to claim 1, wherein the coupling means comprise at least one area (14) of high wettability by the second fluid (7), said area being bounded by an area (15) of low wettability by said second fluid (7), at least in a direction of relative movement of said first and second surface.
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3. A motor according to claim 1 or 2, wherein the coupling means comprise at least one recess (9), which opens into the chamber (4) and is filled with the second fluid (7), so that the at least one volume of second fluid (7a-d) in the chamber (4) will be coupled to the second fluid (7) in the recess (9) through surface tension forces.
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4. A motor according to any one of the preceding claims, wherein the means for locally varying the wettability of the first surface and/or the second surface, comprise a series of neighboring electrodes (10), separated from the second fluid (7) by an interfacial layer (12), and means for sequentially powering successive electrodes (10) so as to apply an electric potential across said interfacial layer (12), causing the condition thereof to switch between low and high wettability by the second fluid (7).
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5. A motor according to claim 4, wherein the electrodes (10) are spaced at substantially regular intervals along an intended path of movement of the or each volume (7a-d) of second fluid.
- 5 6. A motor according to any one of the preceding claims, wherein the second fluid (7) is a liquid.
7. A motor according to claim 6, wherein the second fluid (7) is a liquid metal.
- 10 8. A motor according to claim 7, wherein the first fluid (6) is an electrolyte.
9. A motor according to claim 8 and 2, wherein the first fluid (6) forms the interfacial layer.
- 15 10. A motor according to claim 6, wherein the second fluid (7) is an aqueous solution, for instance water, more particularly salted water.
11. A motor according to claim 10, wherein the interfacial layer (12) is a dielectric layer having a low wettability by the second fluid (7).
- 20 12. A motor according to claim 11, wherein the dielectric layer (12) is made of hydrophobic insulating material.
13. A motor according to claim 12, wherein the hydrophobic insulating material is
- 25 AF1600 and/or parylene.
14. A motor according to any one of claims 10-13, wherein the first fluid (6) is a gas, for instance air, or a liquid, for instance oil.
- 30 15. A motor according to any one of claims 10-14, wherein the second surface is covered by or made of hydrophobic material and provided with at least one area (14) of hydrophilic material, to form an area having a low wettability by the second fluid (7).

16. A motor according to any one of the preceding claims, wherein the first and the second body (3, 5) are both substantially cylindrical, wherein one of the bodies (3; 5) is concentrically received within the other body (5; 3) and the chamber (4) is enclosed between the inner surface of the outer body and the outer surface of the inner body.
- 5 17. A motor according to any one of the preceding claims, wherein the motor is a rotary motor (1), wherein the second body (5) is arranged for rotating movement with respect to the first body (3).
- 10 18. A motor according to any one of claims 1-16, wherein the motor is a linear motor (1'), wherein the second body (5) is arranged for translating movement with respect to the first body (3).
- 15 19. A motor according to any one of claims 16-18, wherein the electrodes (10) are spaced at regular radial intervals along the circumference of one of the bodies (3, 5).
- 20 20. A motor according to any one of claim 16-19, wherein the inner body (3; 5) is the second, moveable body (5).
- 20 21. A motor according to any one of the preceding claims, wherein the first surface belongs to the first body (3) and the second surface belongs to the second, moveable body (5).
- 25 22. A motor according to any one of the preceding claims, wherein the chamber (4) between the first and second body (3, 5) is of capillary dimensions.
- 30 23. A motor according to any one of the preceding claims, wherein the chamber (4) comprises channels for the second fluid (7), said channels being formed by covering the second surface with or making the second surface of a material with low wettability by the second fluid (7) and providing the surface with a channel-constituting pattern of material with high wettability by the second fluid.
24. Optical device, comprising a reflective element and a motor according to any one of the preceding claims, for moving said reflective element.